LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the above-identified application.

Listing of Claims:

1. (Previously presented) A method for correcting illumination nonuniformity across an illumination area during the synthesis of an array of oligomers from monomers, the illumination areas being illuminated by light directed to the illumination areas by a micromirror array during a common deprotection period, the method comprising the steps of:

measuring the illumination intensity of at least two oligomer synthesis positions at different positions in the illumination area, each of the synthesis positions corresponding to a single micromirror in the micromirror array;

evaluating mathematically the difference in illumination intensity between the at least two oligomer synthesis positions to identify a first synthesis position illuminated more brightly and a second synthesis position illuminated less brightly; and

adjusting the illumination intensity of the light directed to the first synthesis position to match that of the light directed to the second synthesis position during the deprotection period by reducing the illumination time in which the micromirror corresponding to the first synthesis position directs light to the first synthesis position as compared to the illumination time in which the micromirror corresponding the second synthesis position directs light to the second synthesis position by switching the micromirror which directs light to the first synthesis position so as to direct light away from the first synthesis position for a portion of the deprotection period.

2.-5. (Cancelled)

6. (Previously presented) The method of Claim 1, further comprising the steps of:

measuring the adjusted illumination intensity of each oligomer synthesis position; and

further adjusting the illumination intensities of each of the synthesis positions for higher uniformity across the entire illumination area.

7. (Withdrawn) An apparatus for synthesizing arrays of oligomers such as DNA probes and polypeptides, the apparatus comprising:

(i) a flow cell having one or more reaction chambers in which monomer addition reactions can be conducted;

(ii) a light source providing a light beam;

(iii) an array of optical elements placed to receive the light beam from the light source and arranged such that each element of the array can be positioned to direct light along an optical axis or to not direct light along the optical axis;

(iv) projection optics capable of receiving the light reflected from the array of optical elements along the optical axis and imaging the pattern of the optical elements onto the flow cell; and

(v) an optical element switch mechanism capable of adjusting the durations of on and off positions of each optical element during one protection group deprotection period to correct for nonuniformity in illumination intensity of the light that the projection optics project onto the flow cell.

8. (Withdrawn) An apparatus for synthesizing arrays of oligomers such as DNA probes and polypeptides, the apparatus comprising:

(i) a flow cell having one or more reaction chambers in which monomer addition reactions can be conducted;

(ii) a light source providing a light beam;

(iii) an array of optical elements placed to receive the light beam from the light source and arranged such that each element of the array can be positioned to direct light along an optical axis or to not direct light along the optical axis;

(iv) projection optics capable of receiving the light reflected from the array of optical elements along the optical axis and imaging the pattern of the optical elements onto the flow cell; and

(v) a lithographic mask placed between the projection optics and the flow cell with different areas of the mask darkened to different gray scales to correct for nonuniformity in illumination intensity of the light that the projection optics project onto the flow cell.

9. (Previously presented) A method for correcting illumination nonuniformity across an illumination area during the synthesis of an array of oligomers from monomers, the illumination area being illuminated by light directed from a micromirror array to the illumination area during a deprotection period, the method comprising the steps of:

measuring the illumination intensity of at least two oligomer synthesis positions at different positions in the illumination area, each of the positions corresponding to the light directed from a micromirror in the micromirror array;

evaluating mathematically the difference in illumination intensity between the at least two oligomer synthesis positions, the evaluation revealing that a first synthesis position is more brightly illuminated than a second synthesis position which is less brightly illuminated; and

adjusting the illumination intensity of the light directed to the first synthesis position during the deprotection period to match that of the light directed to the less brightly illuminated synthesis position during the deprotection period, the adjustment being accomplished by decreasing the portion of the time during the deprotection period that light is directed by the micromirror to the first synthesis position so that the total amount of light directed to the first synthesis position is equivalent to the total amount of light delivered to the second synthesis position.

10. (New) The method of Claim 1, wherein the measuring step comprises the steps of:

covering the at least two oligomer synthesis positions with a first protected nucleotide;

directing an amount of deprotecting light to each covered position via the micromirror corresponding to the covered position, the amount of light being insufficient to fully deprotect each covered position;

binding to the deprotected first nucleotide at each position a complimentary phosphor-linked second nucleotide; and

measuring the illumination intensity of the bound phosphor-linked second nucleotide at each position.

11. (New) The method as claimed in Claim 10 wherein every oligomer synthesis position is covered with the first protected nucleotide.

12. (New) The method of Claim 9, wherein the measuring step comprises the steps of:

covering the at least two oligomer synthesis positions with a first protected nucleotide;

directing an amount of deprotecting light to each covered position via the micromirror corresponding to the covered position, the amount of light being insufficient to fully deprotect each covered position;

binding to the deprotected first nucleotide at each position a complimentary phosphor-linked second nucleotide; and

measuring the illumination intensity of the bound phosphor-linked second nucleotide at each position.

13. (New) The method as claimed in Claim 12 wherein every oligomer synthesis position is covered with the first protected nucleotide.